

This Page Is Inserted by IFW Operations
and is not a part of the Official Record

BEST AVAILABLE IMAGES

Defective images within this document are accurate representations of the original documents submitted by the applicant.

Defects in the images may include (but are not limited to):

- BLACK BORDERS
- TEXT CUT OFF AT TOP, BOTTOM OR SIDES
- FADED TEXT
- ILLEGIBLE TEXT
- SKEWED/SLANTED IMAGES
- COLORED PHOTOS
- BLACK OR VERY BLACK AND WHITE DARK PHOTOS
- GRAY SCALE DOCUMENTS

IMAGES ARE BEST AVAILABLE COPY.

**As rescanning documents *will not* correct images,
please do not report the images to the
Image Problem Mailbox.**



UNITED STATES DEPARTMENT OF COMMERCE
Pat nt and Trademark Office

Address: COMMISSIONER OF PATENTS AND TRADEMARKS
Washington, D.C. 20231

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
-----------------	-------------	----------------------	---------------------

09/427,457 10/16/99 ANDERSEN

G AFB00497

THOMAS C STOVER
ESC JAZ
40 WRIGHT STREET
HANSCOM AFB MA 01731-2903

MM91/0719

EXAMINER

CHANG, A

ART UNIT

PAPER NUMBER

2872

DATE MAILED:

07/19/01

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary

Application No.

09/427,457

Applicant(s)

ANDERSEN, GEOFF P.

Examiner

Audrey Y. Chang

Art Unit

2872

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 30 March 2001.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-39 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-39 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claims _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are objected to by the Examiner.
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Attachment(s)

- 15) ☐ Notice of References Cited (PTO-892)
- 16) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 17) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 18) ☐ Interview Summary (PTO-413) Paper No(s) _____
- 19) ☐ Notice of Informal Patent Application (PTO-152)
- 20) ☐ Other: _____

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on May 4, 2001 has been entered.

Remark

2. This Office Action is also in response to applicant's preliminary amendment filed on March 30, 2001, which has been entered as paper number 9.

3. By this amendment, the applicant has amended claims 1-2, 8, 15-16, 18, 19, 20, 21, 25-26, 32-33, and 36-39.

4. Claims 1-39 remain pending in this application.

5. The applicant is respectfully reminded that starting from March 1, 2001, the amendment to the specification and to the claims must be made in the following format: (1) a **clean** version of each replacement paragraph/section/claim with clear instruction for entry; (2) starting on a separate page any remarks/arguments (37 CFR 1.111); and (3) starting on a separate page, a **marked-up** version entitled "**Version with markings to show changes made**".

6. The rejections to claims 1-18 and 21-37 under 35 USC 112, second paragraph, set forth in the previous Office Action dated January 4, 2001 are withdrawn in response to applicant's amendment, with the **exception** of the rejection to claim 33.

Claim Rejections - 35 USC § 112

7. The following is a quotation of the second paragraph of 35 U.S.C. 112:

Art Unit: 2872

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

8. Claims 1, 2-14, 15-17, 18, 19, 20, 21-31, 32-36, 37, 38 and 39 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 1, 2, 15, 18, 19, 20, 21, 32, 37, 38 and 39 each recites the term "a first coherent beam" and the term "a reference coherent beam" that appear to be vague and indefinite since it is not clear if the coherency is between the first beam and the reference beam. Claims 1, 2, 15, 18, 21, 32, and 37 have been further amended to include the phrase "a coherent beam of the same wavelength as one of the above coherent beams" that appears to be vague and indefinite since it is not clear what is the scope of this phrase. In general, a hologram can only be recorded by interference between two coherent light beams wherein the light beams are generally generated by the same source. The recorded hologram then can only be reconstructed by one of the original beams used to record the hologram. The reconstruct beam then is necessary to have the same wavelength as the recording beams. However it is not clear what is the coherency of the reconstructed beam measured with. Clarifications are required.

The phrase "in a microscope" recited in claims 9, 10, 11 and 27-28 appears to be vague and indefinite since it is not clear if this microscope is the same as the "microscope" recited in their base claims.

5+14. The phrase "said pinhole is replaced by a first spatial filter" recited in claim 12 appears to be vague and indefinite since it is not clear if the pinhole is replaced by an **article**, as claimed in its base claim (claim 2), or is replaced by a **first spatial filter**. The scope of the claim is therefore indefinite.

The phrase "an objective-lens system" and the phrase "a long distance microscope" recited in claim 16 appear to be vague and indefinite since it is not clear how are each of these phrases related to the "optical system" and the "microscope", respectively, in its base claim. Also the phrase "the method ... employing an objective-lens system at a working distance of at least 10 in. from said article to serve as a

Art Unit: 2872

long distance microscope" recited in claim 16 appears to be vague and indefinite. Since it is not clear what is considered here to serve as the long distance microscope. The applicant is respectfully reminded that claims 15 and 16 are basically **method** claims

still The phrase "the article" recited in claims 18 and 37 appears to be vague and indefinite since it lacks proper antecedent basis from earlier part of the claim.

The phrase "a corrective hologram maker for a microscope" recited in claim 19 appears to be vague and confusing since it is not clear what does this phrase mean.

The phrase "an objective-lens" and the phrase "a long distance microscope" recited in claim 33 appear to be vague and indefinite since it is not clear how is each of these phrases related to the "objective" and the "microscope" recited in its base claim. Also the phrase "the method ... employing an objective-lens at a working distance of at least 10 in. from said article to serve as a long distance microscope" recited in claim 33 appears to be vague and indefinite. Since it is not clear what is considered here to serve as the long distance microscope. The applicant is respectfully reminded that claims 32 and 33 are basically **method** claims.

The phrase "an interference pattern of light and dark fringes" recited in claim 36 appears to be vague and indefinite since it is not clear if this interference pattern is the pattern recorded in the hologram originally or is a new interference pattern created by the corrected image beam and the diffracted light beam generated by the reference beam. Clarification is required.

Claims 2-14, 16-17, 22-31 and 33-36 inherit the rejections from their respective base claims.

Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person

Art Unit: 2872

having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. Claims 1, 2-14, 15-17, 18, 19, 20, 21-31, 32-36, 37, 38, and 39 are rejected under 35

U.S.C. 103(a) as being unpatentable over the article "Window aberration correction in laser velocimetry using multifaceted holographic optical elements" by Schock et al, Applied Optics Vol. 23, No. 5, pages 752-756, in view of the patent issued to Friedl (PN. 3,598,466).

Schock et al teaches a holographic optical element that is capable of correcting aberrations of an optical element wherein the *holographic optical element* is formed by generating a *coherent light beam* from a *laser light source*, passing the coherent beam through a beam splitter to split the beam into a *first* and a *second coherent beams*, and then passing the first coherent beam through a *first pinhole plate* and an optical system, having the aberrations desired to be corrected, to form an *object beam* and passing the *second coherent beam* through a *second pinhole plate* and a *collimating lens* to form *collimated reference beam* and directing the object beam and the reference beam to a *holographic recording film* to form the hologram, (please see Figures 6 and 7, pages 754-755).

This reference has met all the limitations of the claims with exception that it does not teach explicitly that the optical system that is intended to be corrected includes an objective. Friedl in the same field of endeavor teaches explicitly a process for the holographic correction of aberrations in an optical system wherein the optical system may include a lens that is in place of a transparent object to be holographed, (please see column 1 lines 6-16). It would then have been obvious modification to one skilled in the art to combine the teachings of Schock et al and Friedl to record a hologram in essentially the same manner as disclosed by Schock et al with an objective lens as the optical system to be corrected for the benefit of providing a hologram that is capable of correcting aberrations of an objective lens. Schock et al teaches that a reconstructed object wave, which is an aberrated diffraction wave, may be reproduced by illuminating the holographic optical element with the reference beam, (please see Figure 7 and columns 1-2 of page 755). Schock et al demonstrated to reconstruct the object wave in an opposite

Art Unit: 2872

direction such that the reconstructed object wave passes through the optical system wherein the aberrations in the object wave are canceled by the optical system. Schock et al teaches that the corrected object wave is then be able to focus at a common focal area which is at position of the pinhole plate in the recording process, (please see Figures 6 and 7). Schock et al however does not teach explicitly that the pinhole plate is replaced by an article such that a corrected image of the article may to be viewed. But by simply retracing the light rays shown in Figure 7 of Schock et al in a forward direction one can easily realize that the image light from an article placed at the focal point or the pinhole plate position passing through the optical system would be aberration-corrected by the holographic optical element. Friedl also teaches that the hologram obtained by using an optical system such as lens as a transparent object may be used with the optical system to obtain corrected image of an object, (please see column 1 lines 15-17 and 3-4 and Figure 1). It would then have been obvious to one skilled in the art to modify the arrangement disclosed by Schock et al to place an article at the focal area or the position of the pinhole to use the hologram as the corrector to obtain a corrected image of an article.

Claims 1, 2, 15, 18, 21, 32, and 37-39 have been amended to include the feature concerning "microscope". However this feature has not given patentable weight because it has been held that a preamble is denied the effect of a limitation wherein the claim is drawn to a structure and the portion of the claim following the preamble is a self-contained description of the structure not depending for completeness upon the introductory clause. *Kropa v. Robie*, 88 USPQ 478 (CCPA 1951). In this case the claims following the preamble each contains a self-contained description of the structure for making a hologram using an objective that does not depend on the "microscope" to be complete.

With regard to the features concerning the optical system may also be a concave mirror and being tilted to an off-axis position, although these references do not teach such features explicitly however since concave mirror is a common type of optical system and the specification fails to teach the criticality of

Art Unit: 2872

having this particular arrangement would overcome any problem in prior art such features are therefore being considered as obvious matter of design choices.

With regard to the features concerning the sizes of the systems, these references do not teach such features explicitly however they are either inherently met by the arrangements of the cited references or an obvious modifications to one skilled in the art since a change in size is generally recognized as being within the level of ordinary skill in the art. In re Rose, 105 USPQ 237 (CCPA 1955).

With regard to the features concerning the holographic optical element being used in a microscope, these references do not teach such explicitly however it has been held that a recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus satisfying the claimed structural limitations. Ex Parte Masham, 2 USPQ2d 1647 (1987).

With regard to the features concerning the pinhole plates used being an array of pinholes, these references do not teach such features explicitly however such modifications would have been an obvious matter of design choice to one having ordinary skill in the art since it is known in the art to use pinhole array to produce a plurality of point light sources for generating a plurality of light beams as opposed to single pinhole as single point light source for generating single light beam and since the specification fails to teach the criticality of having a pinhole array would overcome any problem with using single pinhole plate.

With regard to claim 36, the feature recited is indefinite for the reasons stated above and it can not be addressed here.

Response to Arguments

11. Applicant's arguments filed on March 30, 2001 have been fully considered but they are not persuasive. The newly added features to the amended claims have been fully considered and they are rejected for the reasons stated above.

12. In response to applicant's argument that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, both of the cited references teach a holographic process for correcting the aberrations of an optical system where the optical system may be applied in various applications. The applications of the optical system is not essential for the combination rather the idea of holographic process for making holographic corrector to eliminate aberrations is the essential feature for the combination. The combination is therefore proper.

13. Applicant's argument which states that Figure 7 of cited Schock et al teaches "a photoreducing or micromachining operation which is unsuitable for viewing an article" the examiner respectfully disagrees since Schock never teaches such operations explicitly. Figure 7 of Schock et al teaches explicitly that the rays may be focused to a common focal point or it may be viewed that the light generated from the focal point can pass through the optical system and the hologram corrector to form correct image light of light from that focal point.

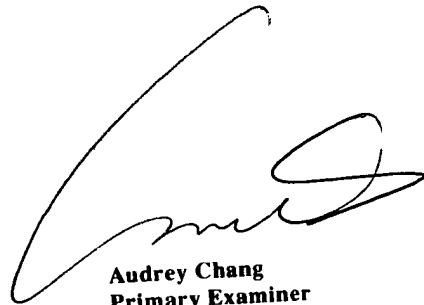
14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Audrey Y. Chang whose telephone number is 703-305-6208. The examiner can normally be reached on Monday-Friday (8:00-4:30), alternative Mondays off.

Art Unit: 2872

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Cassandra Spyrou can be reached on 703-308-1637. The fax phone numbers for the organization where this application or proceeding is assigned are 703-308-7722 for regular communications and 703-308-7722 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

A. Chang, Ph.D.
July 18, 2001

A handwritten signature in black ink, appearing to read 'Audrey Chang', is written over a horizontal line.

**Audrey Chang
Primary Examiner
Technology Center 2800**